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EXAMINER	
SEVER, ANDREW T	

ART UNIT	PAPER NUMBER
2851	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

8

Office Action Summary	**Application No.** 10/677,201	**Applicant(s)** BIERHUIZEN, SERGE J.A.	
	Examiner Andrew T. Sever	**Art Unit** 2851	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-42* is/are pending in the application.

4a) Of the above claim(s) *15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-10,13,14,16-31 and 34-42* is/are rejected.

7)☒ Claim(s) *5,11,12,32 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *2/2004,6/2004, 8/*2004, 6/2005
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species II (claims 1-14 and 16-44) in the reply filed on 5/19/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claim 15 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 5/19/2005.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 4, 6, 7, and 25-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (US 6,739,726.)

Li teaches in figures 4 and 7A a light source apparatus, comprising:

At least a first reflecting device (402 and 408) having first and second focal points (first point is at 404 second is at the entrance of the CPC at 410 as clearly shown);

At least a first arc lamp (404) having a first arc located at about the first focal point of the first reflecting device, the first arc lamp producing first light rays;

A compound parabolic concentrator (CPC) (718) having input and output ends, the input end located at about the second focal point of the first reflecting device to receive the first light rays at the input and over a first range of acceptance angles and emit the first light rays from the output end with a second range of exit angles, the second range being smaller than the first range (see column 2 lines 23-56 which teaches the purpose of the CPC (TLP) also see column 4 lines 29-47 that teaches the numerical aperture is reduced by the TLP 418 or 718); and

An optical integrator (724) having an input aperture positioned to receive the first light rays from the output end of the CPC, and an output aperture from which the first light rays exit with a substantially uniform brightness.

With regards to applicant's claim 2:

In an alternative embodiment shown in figure 8, Part 836 is a substantially spherical reflector.

With regards to applicant's claim 4:

See column 4 lines 3-12.

With regards to applicant's claim 6:

See column 4 lines 48-50 that teaches the light guides both the CPC and optical integrator are made of glass.

With regards to applicant's claim 7:

See column 5 lines 31-45.

With regards to applicant's claims 25, 26, and 27:

The method of providing illumination utilizing the apparatus of Li above is inherent (see MPEP 2112.02)

5. Claims 30, 34, 36, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Chuang (US 6,527,420.)

Chuang teaches in figure 2 a light source apparatus comprising:

First and second reflecting devices (51 and 510) having respective first and second focal points (first point is at the arc lamp second point is not shown but would be in the optics (31, 32, and 33), positioned such that the second focal points are substantially coincident; and

First and second arc lamps (6 and 60) associated respectively with the first and second reflecting devices for producing respective first and second light rays, each arc lamp having an arc located at about the first focal point of the respective first and second reflecting devices.

With regards to applicants' claim 34:

Parts 52 and 520 are substantially spherical reflectors.

With regards to applicant's claim 36:

The reflection devices comprise in part of a parabolic reflector see column 3 lines 20-25.

With regards to applicant's claim 37:

The method of providing illumination, which uses the device of Chuang, is inherent (See MPEP 2112.02)

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claims 1, 2, 4, 6, 7, and 25-27 above, and further in view of Booth et al. (US 6,111,618.)

As described in more detail above Li teaches a light source apparatus which comprises among other things of a first arc lamp and a substantially spherical reflector. Li's reflector however is not taught to be applied to a coating of the first arc lamp. Such a coating is taught in figure 1 of Booth part 14. Booth teaches in column 5 lines 4-20 that such reflectors reduce light losses that would normally arise from the reflector being spaced apart from the arc lamp as taught in figure 8 of Li. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the reflector taught by Booth in the light source of Li.

8. Claims 8-10, 13, 14, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li as applied to claims 1, 2, 4, 6, 7, and 25-27 above, and further in view of Chuang (6,527,420.)

Li, as described in more detail above teaches a light source apparatus which among other things includes a first arc lamp. Li does not teach the use of a second arc lamp nor a reflecting device for combining the image of the two arcs. Such a light source module is taught by Chuang in figure 2, which includes two arc lamps (6), a first and second reflecting device (51 and 510) and a concentration and integration array (31, 32, and 33). Chuang teaches in column 1 lines 14-22 that multiple light source display apparatus have advantages over single light source displays such as those well known in the art as having a redundancy in case of one light failing, a brighter image without requiring expensive single lamps or other optical components. Further Chuang teaches in column 1 lines 61-65 that the particular two lamp system of Chuang can achieve a relatively high light utilization rate while ensuring compactness and lightness compared to prior art two lamp systems. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the two-lamp and corresponding reflector system in the light source apparatus of Li as taught by Chuang to improve the quality of the projected image while maintaining a compactness and lightness.

With regards to applicant's claim 9:

The first and second reflecting devices are parabolic see column 3 lines 21-32.

With regards to applicant's claim 10:

This is shown in figure 8 of Li.

With regards to applicant's claims 13 and 14:

See column 4 lines 48-50, and as can clearly be seen is tapered with the input end having a cross-sectional area that is less then that of the output end.

With regards to applicant's claims 28 and 29:

See above with regards to applicant's claim 8 and 9 respectively.

9. Claims 16, 17, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis (US 2002/0176054) in view of Li (US 6,739,726.)

Mihalakis teaches in figure 1 a projection system, comprising:

An illumination system (62) comprising:

At least a first reflecting device (21);

At least a first arc lamp (20) having a first arc located at the focal point of the first reflecting device, the first arc lamp producing first light rays;

A compound parabolic concentrator (CPC) (23) having input and output ends;

A light valve optical arrangement (63) optically coupled to the illumination system; and

A projection lens (47) optically coupled to the light valve optical arrangement.

Mihalakis does not specifically teach all the claimed components of the illumination system such as the first reflecting device having two foci, the claimed structure of the CPC, and the optical integrator. Such devices are taught by Li which teaches in figures 4 and 7a an illumination system which comprises among other things a reflecting device (402 and 408) having two foci; a CPC (718) which has its input end located at about the second focal point of the first reflecting device to receive the light rays from the first arc lamp at the input end over a first range of acceptance angles and to emit the first light rays from the output end with a second rang of exit angles, the second range being smaller that the first range (see column 2 lines 23-56 which teaches the purpose of the CPC (TLP) also see column 4 lines 29-47 that teaches the numerical aperture is reduced by the TLP 418 or 718); and an optical integrator (724) having an input aperture positioned to receive the first light rays from the output end of the CPC, and an output aperture from which the first light rays exit with a substantially uniform brightness. Li teaches in column 1 line 66 through column 2 line 19 that in certain optical system a dual paraboloid reflector system has advantages of improved performance when coupled with a CPC and integrator as taught by Li. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the illumination system of Li in the projection system of Mihalakis.

With regards to applicant's claim 17:

Mihalakis specifies in paragraph 36 that the modulators are LCOS (liquid-crystal-on-silicon).

With regards to applicant's claim 19:

See paragraph 40 of Mihalakis, which teaches that the light valve has an aspect ratio that matches that of the light impinging on it from the output aperture.

10. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis in view of Li as applied to claims 16, 17, and 19 above, and further in view of Butterworth et al. (US 6,005,722.)

As described in more detail above Mihalakis in view of Li teaches a projection system which among other things includes a light valve optical system and an illumination system. Mihalakis in view of Li does not teach the use of a color wheel in the illumination system. Butterworth teaches such a system in figure 1. Butterworth teaches in column 3 lines 20-39 that by utilizing a color wheel instead of the complicated beamsplitter system of Mihalakis in view of Li, hot spots can be reduced as well as problems associated with graininess of the projected image. Given that by improving these aspects, allows for a better projected image, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a color wheel for frame sequential color project in the projection system of Mihalakis in view of Li as taught by Butterworth.

11. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis in view of Li as applied to claims 16, 17, and 19 above, and further in view of Chuang (US 6,527,420.)

As described in more detail above Mihalakis in view of Li teaches an illumination system comprising a first reflecting device and first arc lamp, however Mihalakis in view of Li does not teach a second reflecting device and second arc lamp. Such a light source module is taught by Chuang in figure 2, which includes two arc lamps (6), a first and second reflecting device (51 and 510) and a concentration and integration array (31, 32, and 33). Chuang teaches in column 1 lines 14-22 that multiple light source display apparatus have advantages over single light source displays such as those well known in the art as having a redundancy in case of one light failing, a brighter image without requiring expensive single lamps or other optical components. Further Chuang teaches in column 1 lines 61-65 that the particular two lamp system of Chuang can achieve a relatively high light utilization rate while ensuring compactness and lightness compared to prior art two lamp systems. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the two-lamp and corresponding reflector system in the light source apparatus of Li as taught by Chuang to improve the quality of the projected image while maintaining a compactness and lightness.

12. Claims 21, 23, 39-40, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis (2002/0176054 in view of Chuang (US 6,527,420.)

Mihalakis teaches in figure 1 a projection system, comprising:

An illumination system (62) comprising:

At least a first reflecting device (21);

At least a first arc lamp (20) having a first arc located at the focal point of the first reflecting device, the first arc lamp producing first light rays;

A compound parabolic concentrator (CPC) (23) having input and output ends;

A light valve optical arrangement (63) optically coupled to the illumination system; and

A projection lens (47) optically coupled to the light valve optical arrangement. Mihalakis does not specifically teach the illumination system further comprises a second reflecting device and a second arc lamp. Such a light source module is taught by Chuang in figure 2, which includes two arc lamps (6), a first and second reflecting device (51 and 510) and a concentration and integration array (31, 32, and 33). Chuang teaches in column 1 lines 14-22 that multiple light source display apparatus have advantages over single light source displays such as those well known in the art as having a redundancy in case of one light failing, a brighter image without requiring expensive single lamps or other optical components. Further Chuang teaches in column 1 lines 61-65 that the particular two lamp system of Chuang can achieve a relatively high light utilization rate while ensuring compactness and lightness compared to prior art two lamp systems. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the two-lamp and corresponding reflector system in the light source apparatus of Li as taught by Chuang to improve the quality of the projected image while maintaining a compactness and lightness.

With regards to applicant's claims 23 and 42:

The light valve arrangement comprises a LCOS light valve in paragraph 36.

With regards to applicant's claims 39 and 40:

Mihalakis teaches in paragraph 2 that the device is used as a rear projection television, computer monitor, and/or in portable data display systems. As is well known in the art these devices get their video from such things as DVD players, video cameras, and set-top boxes (Cable boxes).

13. Claims 22 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis in view of Chuang as applied to claims 21, 23, 39-40, and 42 above, and further in view of Li (US 6,739,726.)

As described in more detail above, Mihalakis in view of Chuang teaches a projection system having among other things an illumination optical system having among other things a (CPC.) However Mihalakis in view of Chuang does not teach an illumination system having the specific CPC and reflectors that applicant claims. Such devices are taught by Li which teaches in figures 4 and 7a an illumination system which comprises among other things a reflecting device (402 and 408) having two foci; a CPC (718) which has its input end located at about the second focal point of the first reflecting device to receive the light rays from the first arc lamp at the input end over a first range of acceptance angles and to emit the first light rays from the output end with a second rang of exit angles, the second range being smaller that the first range (see column 2 lines 23-56 which teaches the purpose of the CPC (TLP) also see column 4 lines 29-47 that teaches the numerical aperture is reduced by the TLP 418 or 718); and an optical integrator (724) having an input aperture positioned to receive the first light rays from the output end of the CPC, and an output aperture from which the first light rays exit with a substantially uniform brightness. Li teaches in column 1 line 66 through column 2 line 19 that in certain optical system a dual paraboloid reflector system has advantages of improved performance when coupled with a CPC and integrator as taught by Li. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the illumination system of Li in the projection system of Mihalakis.

14. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mihalakis in view of Chuang as applied to claim 21 and 23 above, and further in view of Butterworth et al. (US 6,005,722.)

As described in more detail above, Mihalakis in view of Chuang teaches a projection system having among other things an illumination optical system having among other things a (CPC.) Mihalakis in view of Chuang does not teach the use of a color wheel in the illumination system. Butterworth teaches such a system in figure 1. Butterworth teaches in column 3 lines 20-39 that by utilizing a color wheel instead of the complicated beamsplitter system of Mihalakis in view of Chuang, hot spots can be reduced as well as problems associated with graininess of the projected image. Given that by improving these aspects, allows for a better projected image, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a color wheel for frame sequential color project in the projection system of Mihalakis in view of Chuang as taught by Butterworth.

15. Claims 31 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chuang as applied to claim 30, 34, 36, and 37 above, and further in view of Li (US 6,739,726.)

As described in more detail above Chuang teaches a light source apparatus, which includes among other things, first and second reflecting device and first and second arc lamps. Chuang, however, does not teach the use of a CPC. Such devices are taught by Li which teaches in figures 4 and 7a an illumination system which comprises among other things a reflecting device (402 and 408) having two foci; a CPC (718) which has its input end located at about the second focal point of the first reflecting device to receive the light rays from the first arc lamp at the input end over a first range of acceptance angles and to emit the first light rays from the output end with a second rang of exit angles, the second range being smaller that the first range (see column 2 lines 23-56 which teaches the purpose of the CPC (TLP) also see column 4 lines 29-47 that teaches the numerical aperture is reduced by the TLP 418 or 718); and an optical integrator (724) having an input aperture positioned to receive the first light rays from the output end of the CPC, and an output aperture from which the first light rays exit with a substantially uniform brightness. Li teaches in column 1 line 66 through column 2 line 19 that in certain optical system a dual paraboloid reflector system has advantages of improved performance when coupled with a CPC and integrator as taught by Li. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the illumination system of Li in the projection system of Chuang.

With regards to applicant's claim 38:

The method of using the CPC of Li in the projection system of Chuang is obvious.

16. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chuang as applied to claim 30, 34, 36, and 37 above, and further in view of Booth et al. (US 6,111,618.)

As described in more detail above Chuang teaches a light source apparatus, which includes among other things, first and second reflecting device and first and second arc lamps. Chuang, however, does not teach that the substantially spherical reflectors include a mirror coating applied to a portion of the arc lamps. Such a coating is taught in figure 1 of Booth part 14. Booth teaches in column 5 lines 4-20 that such reflectors reduce light losses that would normally arise from the reflector being spaced apart from the arc lamp. Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the reflector taught by Booth in the light source of Chuang.

Allowable Subject Matter

17. Claims 5, 11, 12, 32, and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: The specific numerical amounts/ranges claimed in claims 5, 11, 12, 32, and 33 were not found in the prior art.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Li (US 6,587,269) teaches in figure 5 a projector having a reflector with two foci.

Li (US 6,619,820) teaches in figure 5 a projector having a reflector with two foci as well as a CPC and an integrator.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Sever whose telephone number is 571-272-2128. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W B Perkey

William Perkey
Primary Examiner

AS